

Volume 24: 241–245
Publication date: 1 June 2021
dx.doi.org/10.7751/telopea14797

TELOPEA

Journal of Plant Systematics



plantnet.rbgsyd.nsw.gov.au/Telopea • escholarship.usyd.edu.au/journals/index.php/TEL • ISSN 0312-9764 (Print) • ISSN 2200-4025 (Online)

Grevillea merceri Olde & Marriott (Proteaceae: Grevilleoideae: Hakeinae) an uncommon, geographically isolated species in the *Triloba* Group from subcoastal areas of southern Western Australia

Peter M. Olde ¹ and Neil R. Marriott²

¹National Herbarium of New South Wales, Royal Botanic Gardens and Domain Trust,
Mrs Macquaries Road, Sydney, NSW 2000, Australia

²PO BOX 107, Stawell VIC 3380, Australia
peter.olde@exemail.com.au

Abstract

The existence of *Grevillea merceri* Olde & Marriott, herein described, was brought to light following a single collection by the late Ken Newbey in 1963. His specimen was treated by McGillivray and Makinson (1993: 187) as ‘unassignable to species’ but with possible affinity to *G. paniculata* Meisn., a species very broadly conceptualised in their work. Revision and a more restricted delimitation of *G. paniculata* by Olde & Marriott (1994, 1995) clarified the many significant differences from this specimen and others subsequently found. The relationship of *G. merceri* to other members of the *Triloba* Group however remains uncertain and awaits phylogenetic analysis.

Introduction

Members of the *Grevillea triloba* Group in Western Australia are distributed abundantly between Perth and Kalbarri and extend east to a line between the Fraser Range and Point Malcolm, just east of Cape Arid, at which distance they are infrequent and much less speciose. South of Perth relatively few species flourish, and some are narrowly endemic. Several days spent by the authors in search of *G. merceri*, combing the tracks around Boat Harbour, went unrewarded until its recollection during a plant survey by Mr Jack Mercer in 1996. Mercer’s specimen was gathered on spongolite terraces, a porous stone made from fossilised sponges embedded with silica that formed probably during the Eocene when sea levels were much higher and sponges lived in the warm shallow sea. Several additional populations of *G. merceri* have been subsequently located. Botanist E.M. Sandiford located several populations between Boat Harbour and the Pallinup River with some of these on loamy soils in broad valleys. The new species appears to be geographically restricted.

Morphology

Descriptive layout and morphological terminology used in this and subsequent papers is outlined by Olde (2015). The transition from a Biological Species Concept to a Phylogenetic Concept will necessitate the

recognition of more taxa at specific rank. Phylogenetically untested relationships should not, in the view of the authors, be embedded in the nomenclature and all morphological characters should be treated as equal, rather than hierarchically nested with some potentially trivialised at the expense of others.

Taxonomy

Grevillea merceri Olde & Marriott, **sp. nov.**

Type: Western Australia: Cheyne Bay Reserve, 151 m east of track to Jack's Beach, 5 Sep 2003, N. Marriott NM03036, W. Renzi & J. Mercer (holo: PERTH; iso: NSW 1100123, MEL) (*distribuendi*).

Grevillea Section *Manglesia* Unassignable to Species 'xviii' *sensu* McGillivray and Makinson (1993: 187).

Diagnosis: Related possibly to *Grevillea paniculata* Meisn. which differs in its narrower, ascending to spreading leaf lobes, with the abaxial surface tightly enclosed by the margin including at the sinuses, in its prominent nectary, in its conical pollen-presenter, in its sharply rugose fruits with high-walled ridges and verrucae.

Seedlings not seen. *Mature plants*: bushy, dark green, stenobasic, seed-obligate, apparently self-compatible *shrubs* 0.5–1.5 (–2) m high, 1–2 m wide, with lax, intricately tangled, downward-arching branches. *Branchlets* 1–2 mm thick, slender, angular when young, soon becoming terete, smooth, glabrous or rarely with scattered appressed short hairs, shiny. *New growth* tendril-like, rusty-sericeous, the hairs quickly evanescent. *Adult leaves* divided, 2–4 cm long, 3–7 cm wide, spreading to patent or slightly ascending, petiolate, 3–5-partite, with primary, secondary and occasionally tertiary orders of division, usually the lateral lobes secondarily bi- or tripartite, occasionally with tertiary tripartite division of one or both lateral lobes, the terminal lobe usually simple, elongate, sometimes bi- or tripartite, the lobes divaricate, frequently orthogonal; unimorphic, ovate in gross outline, crowded, frequently tangled, the rachis divaricately refracted; *primary leaf rachis* angularly refracted to \pm orthogonal at each leaf node; segments straight; *basal internode* 9–25 mm long, 1 mm wide, unimorphous, parallel-sided, not alate, spreading at 45° from line of branchlet, straight, not reducing in length when subtending axillary growth, subterete-dipleural; the *adaxial surface* flat, glabrous; *abaxial surface* convex, glabrous; *primary lobes* 3–5, usually patent, sometimes ascending; *terminal lobes* usually simple, elongate, sometimes bi- or tripartite; *ultimate terminal lobes* (0.2–)1–3.5(–4.2) cm long, 1.2–1.7 mm wide, patent to spreading, sometimes descending, linear to acerose, straight or slightly curved, sometimes twisted, usually equal; *lateral lobes* usually secondarily bi- or tripartite, occasionally with tertiary tripartite division of one or both lateral lobes, sometimes retrorse, at each point of division the lobes orthogonal to the main axis; *ultimate lateral lobes* (0.2–)1–3.5(–4.2) cm long, 1.2–1.7 mm wide, patent to spreading, sometimes descending, linear to acerose, straight or slightly curved, sometimes twisted, usually equal; *apices of leaf lobes* acute to subulate, spinescent; *spine* 2–2.25 mm long, reddish amber with yellowish base, rigid, straight, pungent; *margins of lobes* angularly and vertically refracted about the intramarginal vein, almost abutting the midvein on the abaxial surface, enclosing most of the lamina except at the sinuses; *adaxial surface* flat, sometimes channelled beside midvein, glabrous or with a few scattered appressed hairs, smooth, not shiny, the midvein and intramarginal veins prominent; *abaxial surface* sometimes exposed at the sinuses, the epidermis not fully obscured by the margin, otherwise bisulcate, glabrous or with a few scattered hairs, the midvein glabrous, protuberant; *sulcae* 0.2–0.25 mm wide, white-sericeous; *texture* rigidly coriaceous. *petioles* 1–3 mm long, 1.5 mm wide, normal, 3-merous, spreading slightly at the point of attachment, the central segment developed down the branch, the lateral segments closely aligned, scar shape hemispherical; the adaxial surface slightly concave; the abaxial surface convex, glabrous. *Conflorescences* glabrous, terminal or subterminal, simple to 5-branched, secondary development lacking, clearly exceeding the leaves; *unit conflorescences* 1–1.5(–3.5) cm long, 1 cm wide, shortly cylindrical, 20–40 flowered, acropetal; *buds* 2 mm long, 0.6 mm wide, pedunculate, cylindrical to narrowly conico-cylindrical, pedunculate, not overarched by bractiform leaves, development not arrested; *peduncles* 5–10 mm long, glabrescent, slender; *floral rachises* 8–30 mm long, erect, straight, usually uniformly slender with slight distal taper, glabrous or with a few scattered appressed hairs; *rachis nodes* obscure, glabrous, the rim oblique; *involucral bracts* 1.25 mm long, *c.* 0.7 mm wide, ovate-apiculate, glabrous-ciliate, caducous at early bud stage; *common bracts* (subtending a single flower-pair) 0.5–0.8(–2) mm long, 0.5 mm wide, ovate, strongly inflected from *c.* half-way, reddish to rusty silky outside or sometimes glabrous with sparsely ciliate margins, variably caducous, most detaching as the bud develops but some persistent beyond anthesis. *Flower colour* white or pinkish-white with grey-green limb ageing reddish-cream. *Flowers* acroscopic, not nectariferous, slightly fragrant, entomophilous (pollinator unknown), glabrous; *pedicels* white, 7–11.5 mm long, 0.2–0.3 mm wide, filamentous, the apex below the torus scarcely expanded, spreading to ascending, straight to decurved, not crowded; *basal pedicels* white, 9–11.5 mm long; *distal pedicels* 7–9 mm long; *torus* *c.* 0.4 mm across, square in polar view, scarcely wider than pedicel apex, transverse to oblique at *c.* 10°; *nectary* absent or obscure, white and rising *c.* 0.1 mm above the torus, crescentic, margin entire. *Pistils* 4–4.5 mm long; *gynophore* 1.5–3 mm

long; *ovary* 0.7 mm long 0.5 mm wide, round in side-view to slightly ovoid or ellipsoid with oblique base, slightly compressed laterally, not wrinkled after fertilisation; *style* constricted above ovary, then dilated; *stylar constriction* 0.1–0.3 mm long, 0.3 mm thick, incurved; *stylar swelling* 0.8 mm long, 0.7 mm maximum width, subcylindrical, abruptly dilated proximally, tapering slightly distally, sometimes then broadening slightly again below the style-end to 0.6 mm; *pollen-presenter* 0.6–0.7 mm long, truncate-conical to subcylindrical with straight to slightly incurved sides; *base* 0.7 mm wide, transverse to oblique at 10–20°, abruptly divergent from the style-end, rimmed; *stigma* 0.2 mm wide, transverse. *Perianth* c. 4 mm long, actinomorphic, *perianth tube* white, 2.5 mm long, 0.7–0.8 mm maximum width, narrowly obovoid, contracting below the limb into a neck 0.4–0.6 mm wide; *perianth limb* reddish-cream, 1.5 mm long 1.7 mm wide, subglobose with slight apical compression; *tepals* 4.5 mm long, 0.4 mm wide at base, 0.8 mm wide at widest point, 0.5 mm below the limb, abaxial surface with midrib prominent; adaxial surface smooth; *tepal-limbs* 1.2–1.5 mm long 1 mm wide, midrib prominent to obscure. *Follicles* 8–9 mm long, 5–5.5 mm wide, oblong-ellipsoidal, oblique on incurved gynophore with attachment subposterior, c. 1 mm from base; *fructual style* straight to decurved, attached obliquely to the dorsal side of the pericarp more or less lateral to the dorsal surface; *fructual pollen-presenter* truncate-conical to cylindrical; *pericarp* 0.4–0.5 mm thick along the suture, slightly thicker at the ends; exocarp smooth to slightly colliculose; *mesocarp* crustaceous; *endocarp* smooth. *Seeds* not seen. (Figures 1, 2)



Fig. 1. *Grevillea merceri*. A. Dense flowering branchlets and leaves. B. Flowering branchlet. C. Close-up of conflorescence. Photos by: A, Peter Olde; B, C, I. Gilmour.

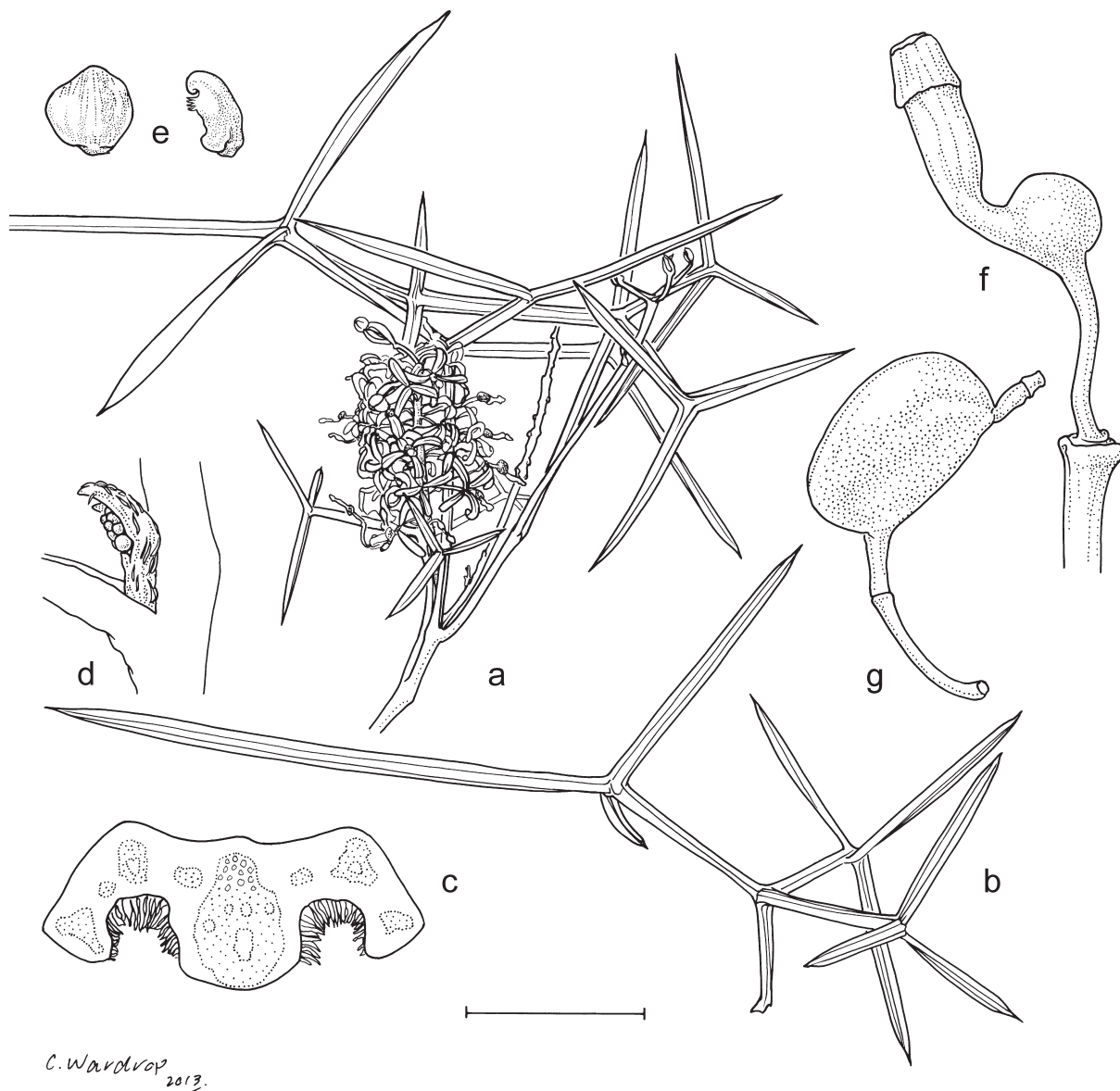


Fig. 2. *Grevillea merceri*. a. Flowering branch with an unbranched confluence. b. Leaf. c. Transverse section of leaf lobe. d. Unit confluence bud. e. Common bracts subtending flower pairs. f. Pistil. g. Follicle. Scale bar: a = 20 mm; b = 15 mm; c, d = 1 mm; f = 2 mm; g = 7.5 mm. Illustration by Catherine Wardrop from fresh and spirit material grown on Peter Olde's property.

Diagnostic characters: Stenobasic, seed-obligate, mostly glabrous shrub with spreading, tangled branchlets and foliage; leaves 3–5 partite often with orthogonal divarication and up to 3 orders of division; basal internode linear; ultimate leaf lobes > 1 mm wide, the abaxial surface not fully enclosed by the margins, the terminal lobe often elongate to 4 cm long; confluences terminal or subterminal, branched, pedunculate; buds narrowly conico-cylindrical; common bracts 0.5–0.8(–2) mm long, 0.5 mm wide, ovate, glabrous-ciliate, rarely sericeous on the abaxial surface; floral rachises 8–30 mm long, glabrous, the nodes obscure; nectary obscure; pollen-presenter 0.6–0.7 mm long, truncate-conical to subcylindrical; stigma 0.2 mm wide, fruits follicular, monospermous with smooth exocarp; mesocarp crustaceous; fructual style with pollen-presenter cylindrical or truncate-conical.

Distribution: Western Australia, south coast, from the Boxwood Hills area, east of Jerramungup and the Pallinup Valley to Boat Harbour. It occurs in the Fitzgerald Subregion of the Esperance Plains IBRA Region.

Phenology: Flowers from late winter through spring. Fruits form mainly from late spring.

Habitat and ecology: *Grevillea merceri* grows in yellowish sand or in rocky soil composed of laterite and spongolite and shallow pockets of fine brown sand, occurring on soils derived from the Tertiary Pallinup Formation. It occurs subcoastally on ridge tops at the edge of uneroded dykes or uncollapsed spongolite terraces

in low, open heathland with *Leptospermum* sp. Associated species recorded at one site include *Banksia media*, *Hakea marginata*, *H. nitida*, *H. pandanica* ssp. *crassifolia*, *Kunzea pauciflora* and *Melaleuca violacea*. In the Lower Pallinup Valley, it grows with *Eucalyptus thamnoides* in Tall Mallee over Mixed Tall Open Shrubland with *Acacia leioderma*, *Hakea laurina*, *Melaleuca pentagona* and *Templetonia retusa*.

Conservation status: *Grevillea merceri* is known now from several populations within a geographically restricted area, although one population contains only 10 individuals. The species does not appear to be at all common in its preferred habitat. A suitable conservation code for Western Australia should be applied after populations have been assessed.

Etymology: This species is named after Jonathon 'Jack' William Mercer B.Sc. (Hons) (16 Apr 1953 –) who rediscovered this species during a plant survey and provided great help to the authors in relocating it for field assessment.

Variation: There is some minor variation in habit and flower colour. At Cheyne Beach a dense shrub with shortly arching branches and very showy rich brown flower buds, slowly becoming ontogenetically orange-yellow was observed. The second shrub had a more open starfish-shaped habit with long, arching branches and pale green-yellow buds becoming cream with development.

Discussion: McGillivray and Makinson (1993: 187) treated the taxon, here described as *Grevillea merceri*, as Section *Manglesia* Unassignable to Species 'xviii'. It was then known from a single collection (*Newbey* 809). They suggested a possible affinity with *G. paniculata* perhaps because of its glabrous branchlets and floral rachises. *Grevillea paniculata* differs in its leaf lobes narrower (0.5–0.8 mm wide), with ascending to spreading orientation, and with the abaxial surface tightly enclosed by the margin including at the sinuses, in its nectary prominent, rising up to 0.2 mm above the torus, in its pollen-presenter conical, in its fruits with a rugose exocarp with high-walled, sharp ridges and verrucae. The smooth fruits of *G. merceri* suggest a possible relationship with *G. levis* which differs in its usually rhizomatous habit, its narrower, spreading leaf lobes 0.5–0.8 mm wide, its prominent nectary and in its more prominent floral rachis nodes.

Specimens seen: WESTERN AUSTRALIA: Cheyne Bay Reserve, N of Cape Riche, 11 Oct 1996, *J.W. Mercer* 179 (PERTH); Boat Harbour, 6 Aug 1963, *K. Newbey* 809 (PERTH); Terraces adjacent to track leading to Jack's Beach, Boat Harbour, 27 Sep 2004, *P.M. Olde* 04/281 & *D. Shiells* (BRI, CANB, HO, K, MEL, NSW, PERTH); South Coast Highway, 6–6.5 km east of Circuit Rd., west of Swamp Rd., Wellstead, 16 Sep 2015, *P.M. Olde* 15/225 & *I. Evans* (NSW); 56 km from Jerramungup along road to Albany, 34°22'S 118°44'E, 28 Sep 1983, *R.W. Purdie* 5424 (CBG); Lower Pallinup Valley, c. 750 m S of Pallinup River and 1.3 km WSW of Beaufort River, 6 Apr 2016, *E.M. Sandiford* 2214 (PERTH).

Acknowledgements

We wish to thank the directors of CANB, NSW and PERTH for providing access to their collections. Catherine Wardrop illustrated this species very beautifully utilising funds provided by an ABRS grant under the National Taxonomy Research Grant Program (NTRGP) Grant Number CN212–05, which was awarded to one of the authors (Olde) in 2012–13. I. Gilmour provided photographs. We especially thank Jack Mercer for assisting us in relocating the species and Wendy Renzi (now Wendy Marriott) for assistance with field work. Two referees provided comments that improved the manuscript.

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